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[54] **UNDERWATER ACOUSTIC SEARCH ANGLE SELECTION SYSTEM AND METHOD OF SPECIAL UTILITY WITH SUBMERGED CONTACTS**

[75] Inventor: **David S. Cwalina**, Tiverton, R.I.

[73] Assignee: **The United States of America as represented by the Secretary of the Navy**, Washington, D.C.

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[52] **U.S. Cl.** **114/21.3**; 114/23

[58] **Field of Search** 114/21.2, 21.3, 114/23; 244/3.11, 3.12

Primary Examiner—Charles Jordan
Assistant Examiner—Matthew J. Lattig
Attorney, Agent, or Firm—Michael J. McGowan; Prithvi C. Lall; Michael F. Oglo

[57] **ABSTRACT**

A search angle selection system determines acoustic homing beam offset angles to be used by a torpedo from a group of target depth conditions in response to given environmental, tactical, target and weapon information. The system optimally bounds the region that is to be insonified. The system determines the search angle which best insonifies the depth band, that is, the region between the upper depth bound and the lower depth bound, for each search depth, accounting for the weapon's attack angle, including search depths which are not in the depth band itself. For each search depth, the system determines the relative depth separation of the search depth from each of the bounds, and based on this separation an aimpoint which projects from a reference plane through the torpedo is chosen at the depth of each bound. The aimpoint is selected from a table of empirically-determined values. The system modifies the aimpoint when strong negative gradients in the sound velocity profile are present in the ocean environment, and also in the case of strongly conducted rays. A reference insomnification beam axis angle is iteratively determined for each search depth with the axis causing a raypoint which intersects along the respective bound. The pair of reference beam axes whose ray paths intersect the upper and lower bound at the aimpoint for each search depth are averaged to provide the optimal homing beam angle for that search depth.

12 Claims, 6 Drawing Sheets